



Energy Insecurity in the US and Arizona:

State of the field, Gaps and Opportunities

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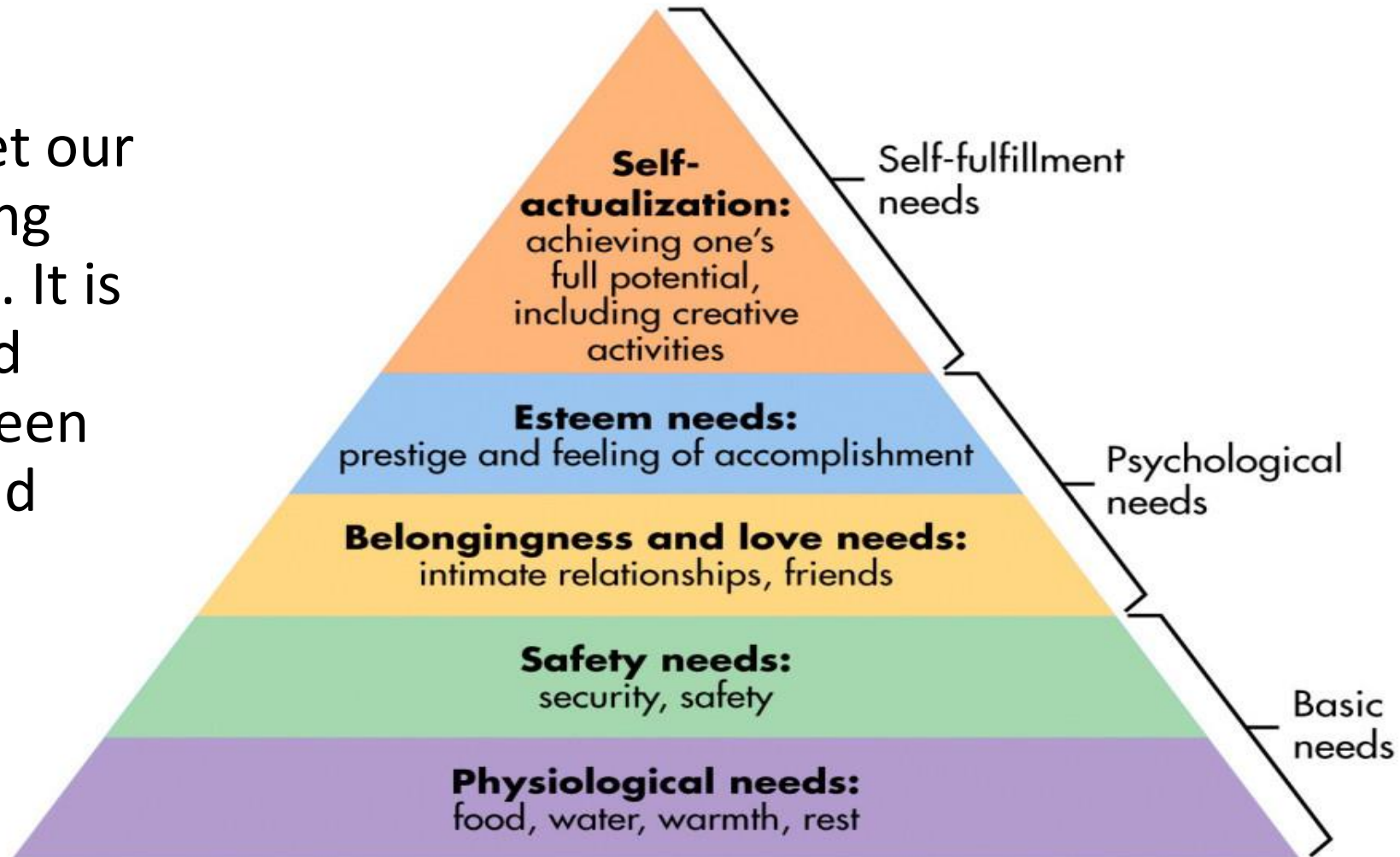
MAILMAN SCHOOL
of **PUBLIC HEALTH**



Energy is a Basic Necessity of Life

“Energy is essential to meet our basic needs: cooking, boiling water, lighting and heating. It is also a prerequisite for good health- a reality that has been largely ignored by the world community.”

(World Health Organization, 2006)



Context on Energy Consumption and Costs

- Over the past 40 years, U.S. household have become more reliant on electricity, natural gas, and other fuels
- The cost of energy has increased
 - Average retail price of electricity
 - 1975: 3.5 cents/kwh
 - 2005: 9.45 cents/kwh
 - 2018: 12.89 cents/kwh
- Average American household uses 867 kwh/month and receives an electricity bill of \$111.67/month
 - This trend is similar for natural gas and heating oil and other basic necessities
- The ability to afford energy is a growing concern for Americans

Your Account Number
I 199999987631 000000221754 0000 2056 0 000000000000 H

Consumers Energy

"IF YOU SMELL GAS, CALL US IMMEDIATELY DAY OR NIGHT AT 1-800-477-5050"

LANING, MI 48937-0001

JOHN DOE
903 ANYSTREET
ANYTOWN MI 49999-9999

Due Date 03/02/10 Total Due \$221.75

Amount Enclosed \$

ECP / 100 06 2-11-2010

FOLD AT PERFORATION, DETACH AND MAIL TOP PORTION WITH YOUR PAYMENT 289999611762 2818/02

IN AN EMERGENCY, CALL US 24 HOURS A DAY AT 1-800-477-5050.

For non-emergencies or information about rates and services, call 1-800-477-5050, visit us on the Internet: www.consumersenergy.com, or use our 24-hour fax at 1-800-363-4806.

NAME	JOHN DOE	ACCOUNT NO.	1999 9998 7631
SERVICE ADDRESS	903 ANYSTREET ANYTOWN MI 49999-9999	BILLING PERIOD	01/09/10-02/05/10
		DAYS BILLED	28
		DUE DATE	03/02/10

RATE: 1000W Elec Res Rate RS
250 Gas Res Serv Rate A - With Sp Mtg

POD: 0000002782094
POD: 0000002782095

METER NUMBER	LOCATION	BEGIN READ	END READ	READ TYPE	DIFF	CONSTANT	CORR FCTR	METER ENERGY USE	UNIT
59779953	903 ANYSTREET	23201	23826	ACT				625	KWH
23029488	903 ANYSTREET	3219	3350	ACT	131	0.1	1.00000	13.1	MCF



Energy Insecurity

Definition:

“An inability to adequately meet basic household energy needs”

(Hernández, *Soc Sci & Med* 2016)

Three Dimensions:

- **Economic**- high bills, low income
- **Physical**- inefficiencies, faulty home energy infrastructure and appliances
- **Behavioral**- Coping Strategies



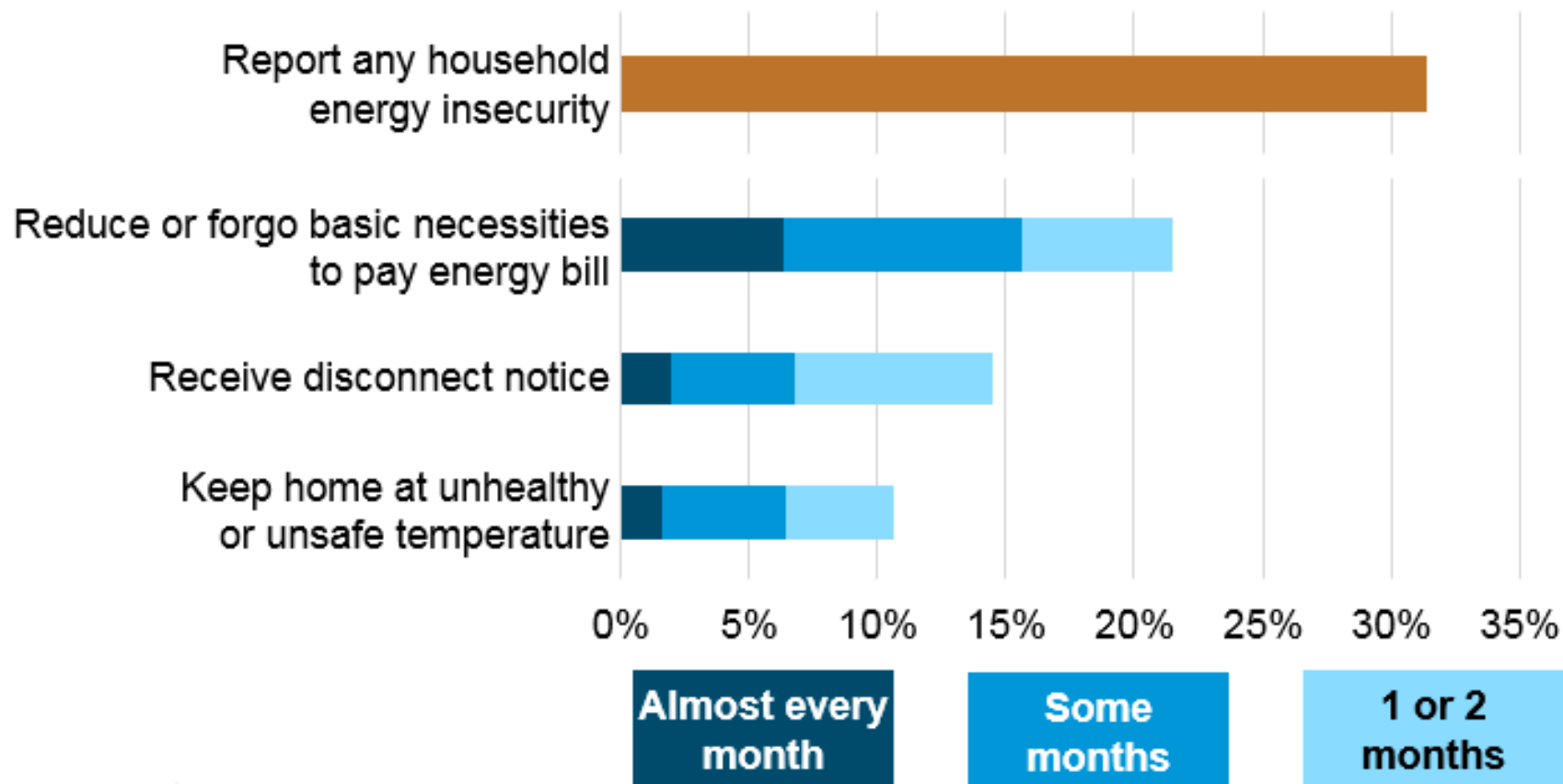
Who in the US is Energy Insecure?

Prevalence and sociodemographic distribution



One in three U.S. households are energy insecure

Households experiencing household energy insecure situations, 2015
percent of households

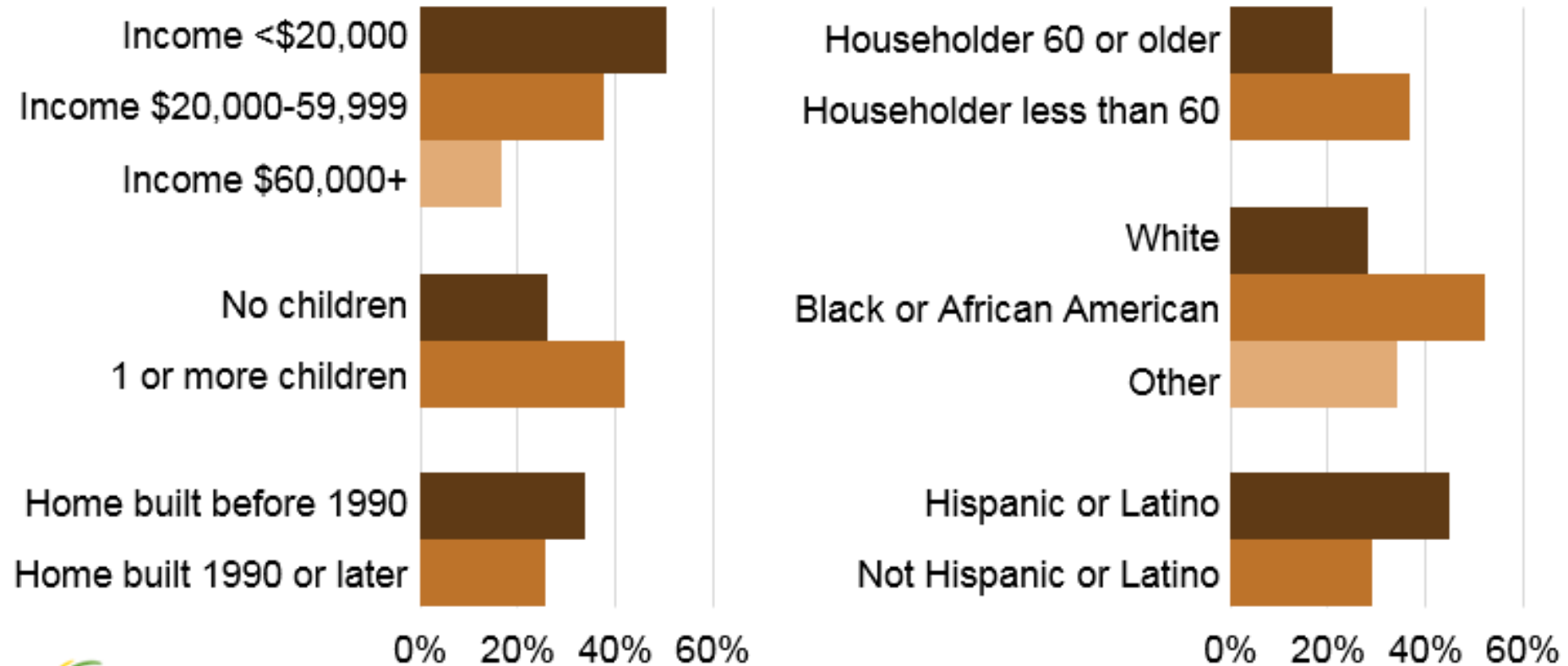


Source: U.S. Energy Information Administration, Residential Energy Consumption Survey 2015



Energy insecurity is patterned by vulnerability

Household energy insecurity by household characteristics, 2015
percent of households



Source: U.S. Energy Information Administration, Residential Energy Consumption Survey 2015

How are Americans Energy Insecure?

Energy cost burdens

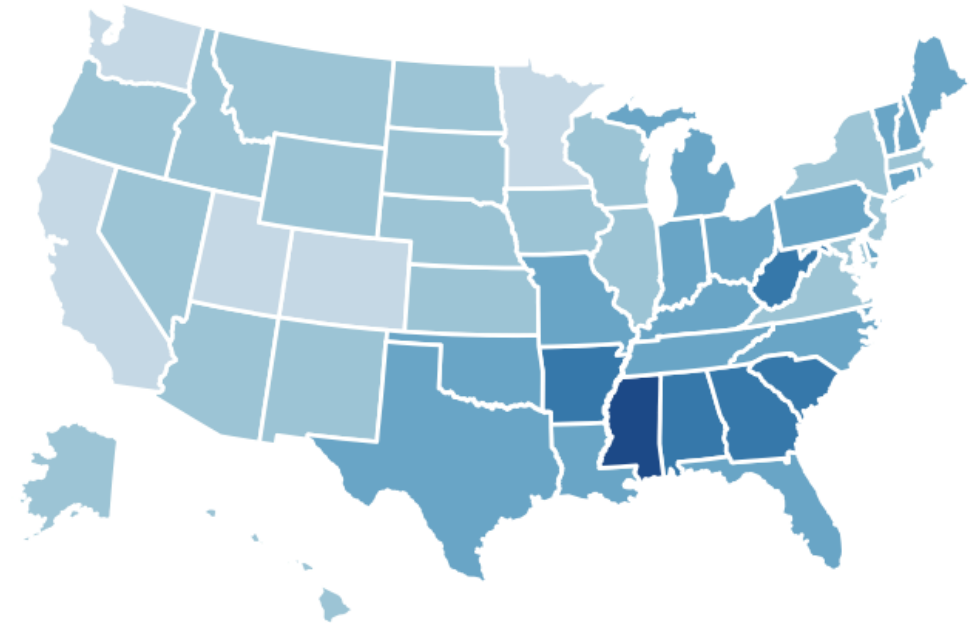
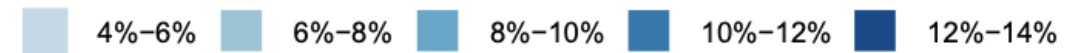
Disconnections and coping

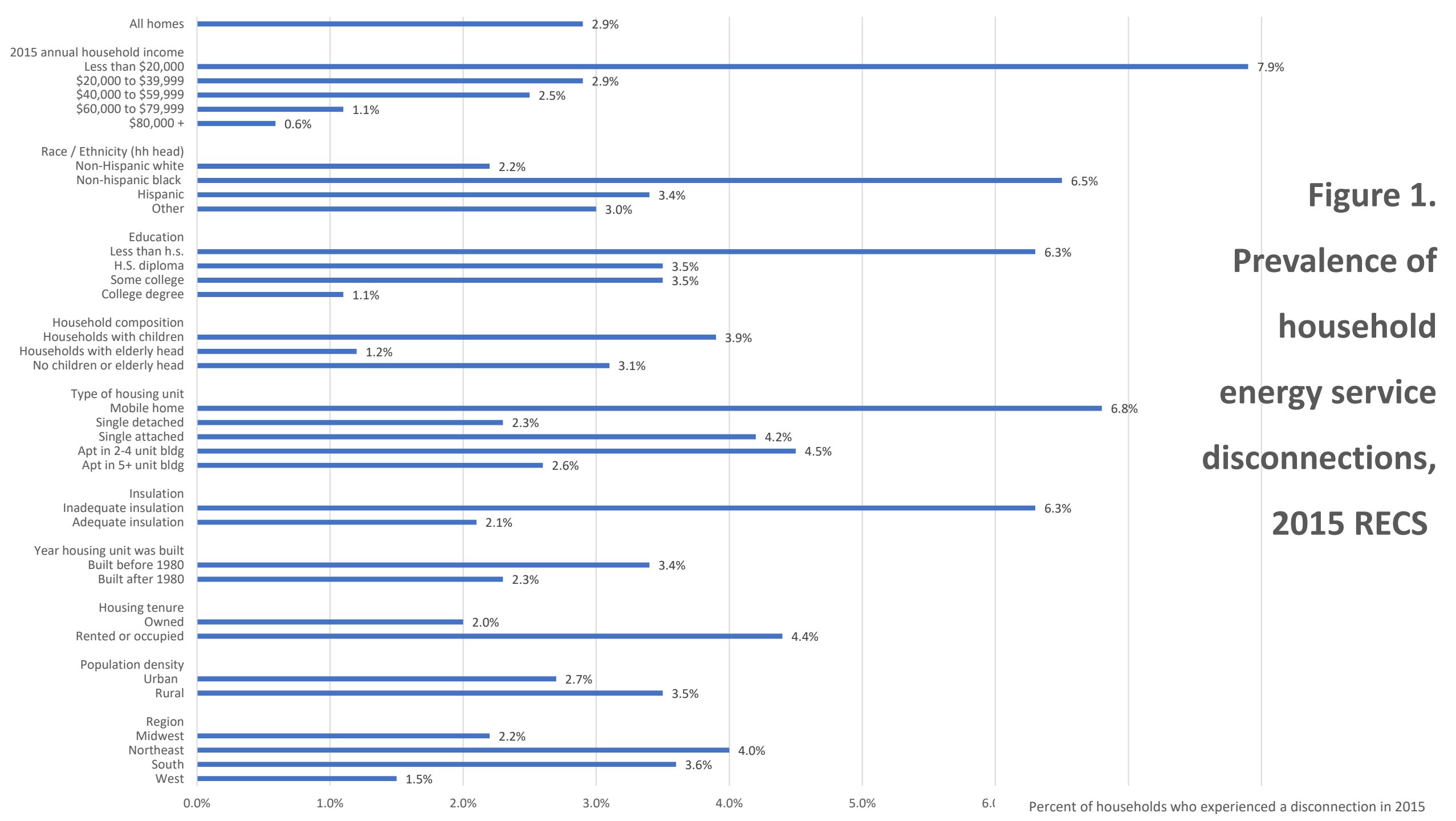
Access to Energy Efficiency and Clean Energy

Increasing Energy Cost Burdens among Low-Income Americans

- Low-income households pay 7.2% of household income on utilities – more than three times the amount that higher income households pay, 2.3%.
- Greater energy efficiency would reduce energy burden by:
 - 35% for low-income households
 - 42% for African American households
 - 68% for Hispanic households

Low-Income Energy Burden (% of Income)





Coping with Disconnections

Figure 2. Coping strategy by disconnection status



Disproportionate Climate Impacts, Housing Conditions and The Just Transition

Rising temperatures and heat island effects drive up costs and add new financial burdens for the insecure

Delayed Adoption of Clean Energy technologies and efficiencies among Low/Moderate Income groups and Black, Indigenous and People of Color

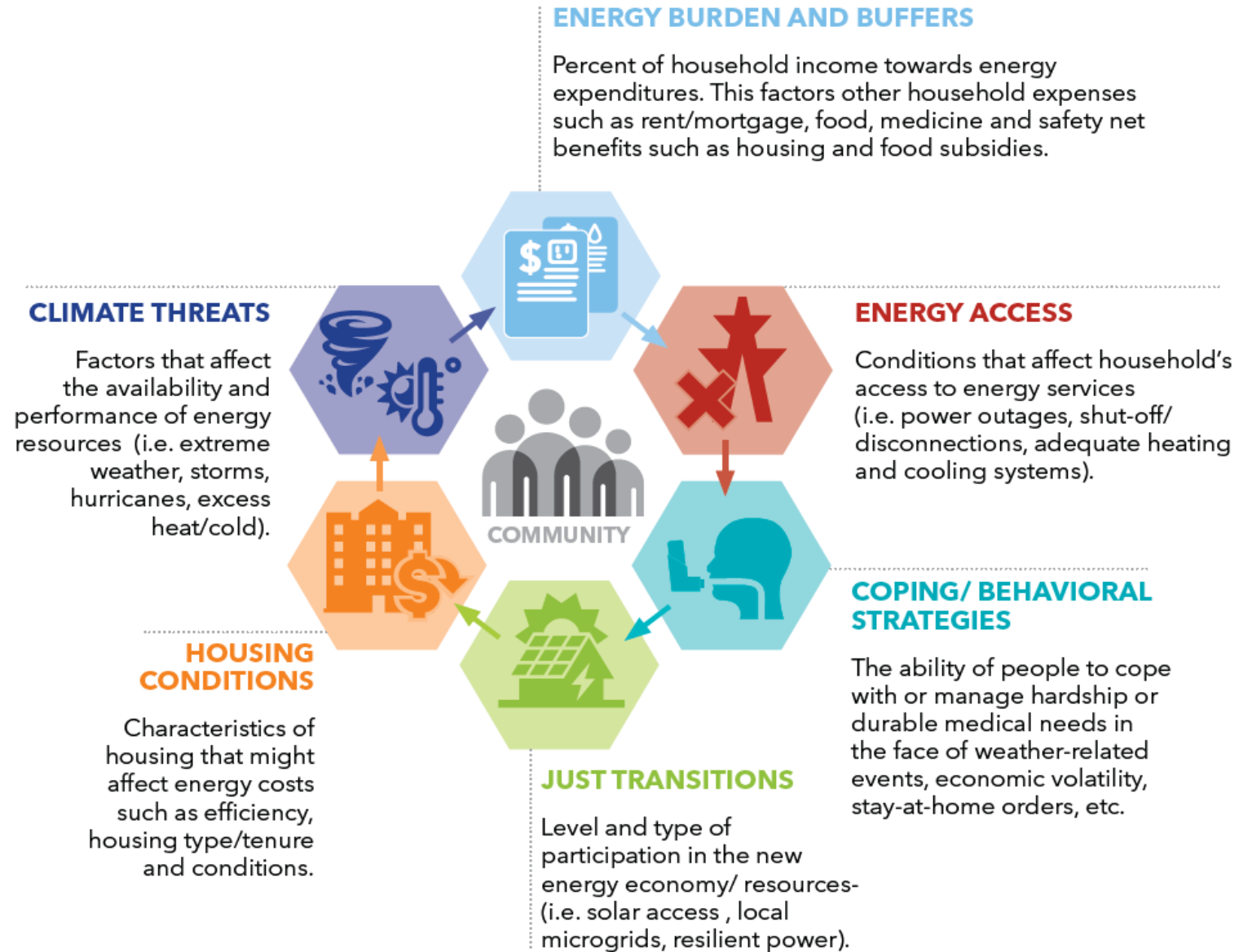
Black, Hispanic and lower income households are more likely to live in housing with maintenance defects, higher energy use intensity (a marker of inefficiency) and in older homes that have not been significantly updated to increase performance.]

Weatherization interventions are limited and do not cover the full extent of the need.

Poorer housing conditions and renter housing tenure status precludes many from participating in the clean energy transition.



UNDERSTANDING ENERGY INSECURITY



Developing a Methodology for EI Index

Measures and Data

Climate Threats

- Daily temps
- Heat/weather advisory
- Severe weather events
- Electricity-dependent populations
(emPower for those on medicaid/medicare)



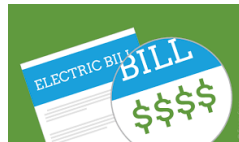
Energy Access

- Duration/frequency of power outages
- Duration/frequency of disconnections
- Accounts closed and reopened under different name or address
- Number of heating/cooling stations
- State disconnection policy parameters
- Availability of pre-paid meters



Energy Burden and Buffers

- Average household income to energy expenditures
- Utility rates (\$ per kwh)
- Low-income energy programs (sources and levels of support from comm. orgs & utilities)
- LIHEAP funding (level and type)



Housing Conditions

- heating/cooling use intensity
- housing quality/need for repair
- access to AC/heat
- housing code violations
- residential instability



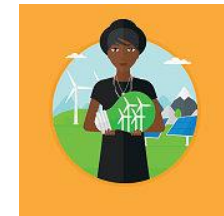
Coping Strategies

- extreme home temperatures/thermal vigilance
- alternative heating/cooling methods
- energy conservation (extreme)
- partial payments
- trade-offs



Just Transitions

- community solar projects
- utility level solar/wind
- household level solar penetration level
- solar + storage availability



Heat-related deaths, Maricopa Summer 2020

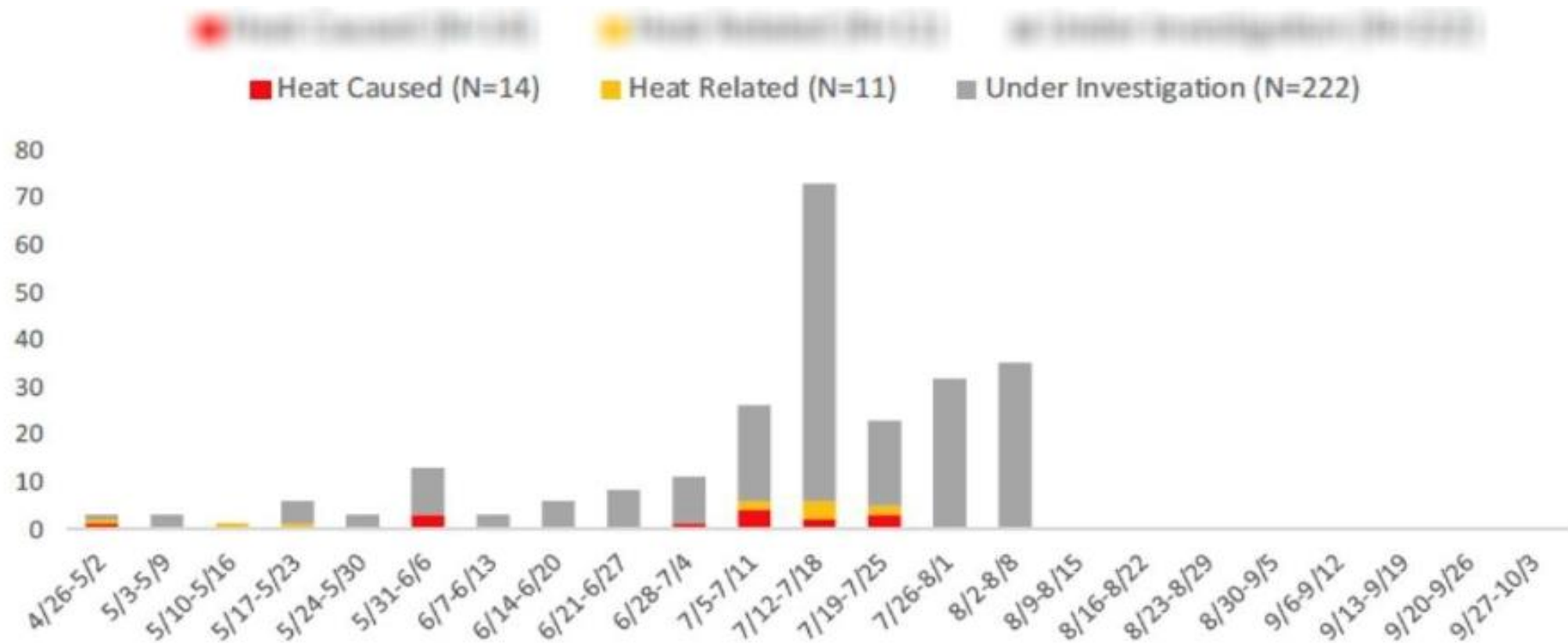
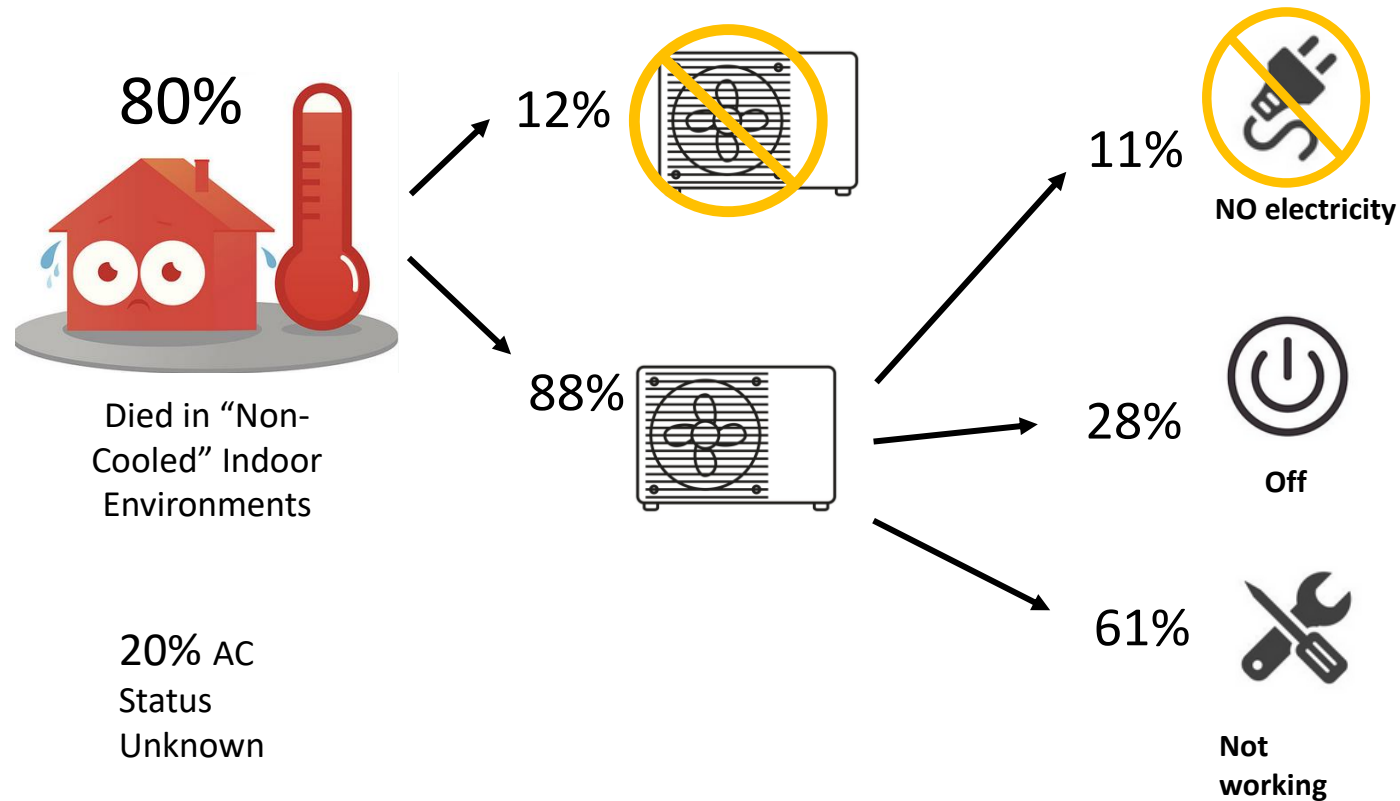


Table 1. Summary of 2020 and 2019 heat-associated cases during the same weeks.

	2020 Cases			2019 Cases		
	Confirmed	Under Investigation	First Confirmed	Confirmed	Under Investigation	First Confirmed
Season Cumulative Total	25	222	06/08/2020	27	122	06/03/2019

Why Maricopa County?



Why are people dying in indoor environments?

POWER
to the
PEOPLE!



The human side of household energy





El National Study: Sites





Energy Insecure in the US





In the Dark



Angela

Age: 23, Mother of 3

Housing: Renter, apartment complex





Everything Changed



Mrs. Mary
Age: 62, Recent Widow
Housing: Renter, single-family
Utilities: Electricity (\$100-300 mo)





Indebted



Roger

Age: 43

Housing: Homeowner, Single Family

Income: >\$49,000/ year

Utilities: Electricity (>\$4,000/yr)



ENERGY INSECURITY IN PHOENIX



BACKGROUND

- Overall, participants were **financially vulnerable** due to low or fixed incomes. Many experienced sudden economic or personal **setbacks** related to work, health, or relationships. Many participants, especially renters, were burdened by high housing costs. Limited financial resources and setbacks often precipitated an inability to pay bills.
- Participants often faced multiple **adverse life experiences** including homelessness, domestic violence, disability and trauma that precluded working, and high/unexpected medical bills. Issues such as limited educational attainment and childcare needs and expenses also impacted hardship.
- Poor housing conditions** such as drafts; inadequate insulation; outdated appliances; and leaking plumbing were widespread, and often reduced energy efficiency, driving up bills. Property owners also reported financial setbacks from very expensive maintenance issues that had to be fixed quickly.
- Summer** was a time of particular hardship for participants, as Phoenix temperatures rose along with air conditioning costs.



MANAGING CONSUMPTION AND COSTS

- To **reduce costs**, participants almost universally reported forgoing or reducing energy consumption. Many kept their homes at uncomfortable temperatures, spent time away from home to avoid usage, or used alternative (non-energy reliant) ways to keep warm or cool.
- To **manage bills**, participants would “juggle” by delaying or forgoing some bills; turn to family members for help, if they had more resources; or use the pre-paid meter option known as the M-Power program.
- Participants generally **avored pre-paid meters**, as it allowed them to closely monitor consumption, manage costs and avoid large bills. However, it also spurred shut-offs if participants did not have money to add, and it could be difficult to get to a station to add more credit. Several participants were actively living through a shut-off at the time of the interview.
- Many participants **preferred one utility company** (SRP) because in addition to offering the pre-paid meter option, they were also generally more flexible with payments, had lower rates and were willing to accommodate the population's needs.



HEALTH IMPACT

- On a widespread basis, respondents described significant **depression, anxiety, and worry** over their inability to pay their bills. Many of them were also experiencing broader stresses and worries (e.g., over unemployment or health concerns) which intensified mental health issues, particularly for parents with children in the household and the elderly.
- Respondents described **physical health conditions** that emerged as a result of stress over bills, such as abdominal pain or AFib flare-ups that resulted in hospitalization. Lack of thermal comfort also resulted in physical health issues, such as arthritis flare-ups and poor sleep.
- Health could also serve as a **cause** of energy insecurity, due to high medical bills or energy usage for medical equipment and to accommodate health conditions such as asthma or arthritis.

RECOMMENDATIONS

DIRECT CLIENT SUPPORT

REFER CLIENTS TO WEATHERIZATION ASSISTANCE

Poor housing conditions, such as cracks and holes in windows or walls, can reduce energy inefficiency and drive up bills. The government, as well as private organizations, provide weatherization assistance to address these issues.

LINK CLIENTS WITH BEHAVIORAL HEALTH SUPPORT

Energy insecurity can contribute to significant stress and anxiety. Furthermore, many people experiencing energy insecurity also cope with other stressful life experiences. Connecting clients to resources that support mental health can help reduce the adverse health effects of energy insecurity.

ENROLL CLIENTS IN INCOME SUPPORT PROGRAMS

Many people experiencing energy insecurity are eligible for income-based programs such as SNAP and WIC. Reduced financial burden around these other expenses can help reallocate resources to pay energy bills, reduce stress, and reduce risk of cutting back on health-related resources such as food to pay energy bills.

CONNECT MEDICALLY VULNERABLE CLIENTS TO SHUTOFF PROTECTION

Utilities companies are often willing to forgo shutoffs in instances in which it most clearly jeopardizes residents' health, such as if there is medical equipment in the home. Appealing to utilities companies based on medical need may be effective.

ADVOCACY

FRAME AS A PUBLIC HEALTH PROBLEM

Efforts to frame social issues such as mass incarceration and gun violence as public health issues have been successful in gaining public interest and sympathy and moving these issues onto the public agenda. Given the many public health implications of energy insecurity, this framing is appropriate here as well.

ENGAGE ELECTED OFFICIALS IN ADVOCACY FOR INCREASED LIHEAP FUNDING

Given the scale and scope of the need, today's level of LIHEAP funding is clearly insufficient. Participants frequently stated that they do not think government officials understand the scope of the problem. Publicize information about energy insecurity and create public pressure.



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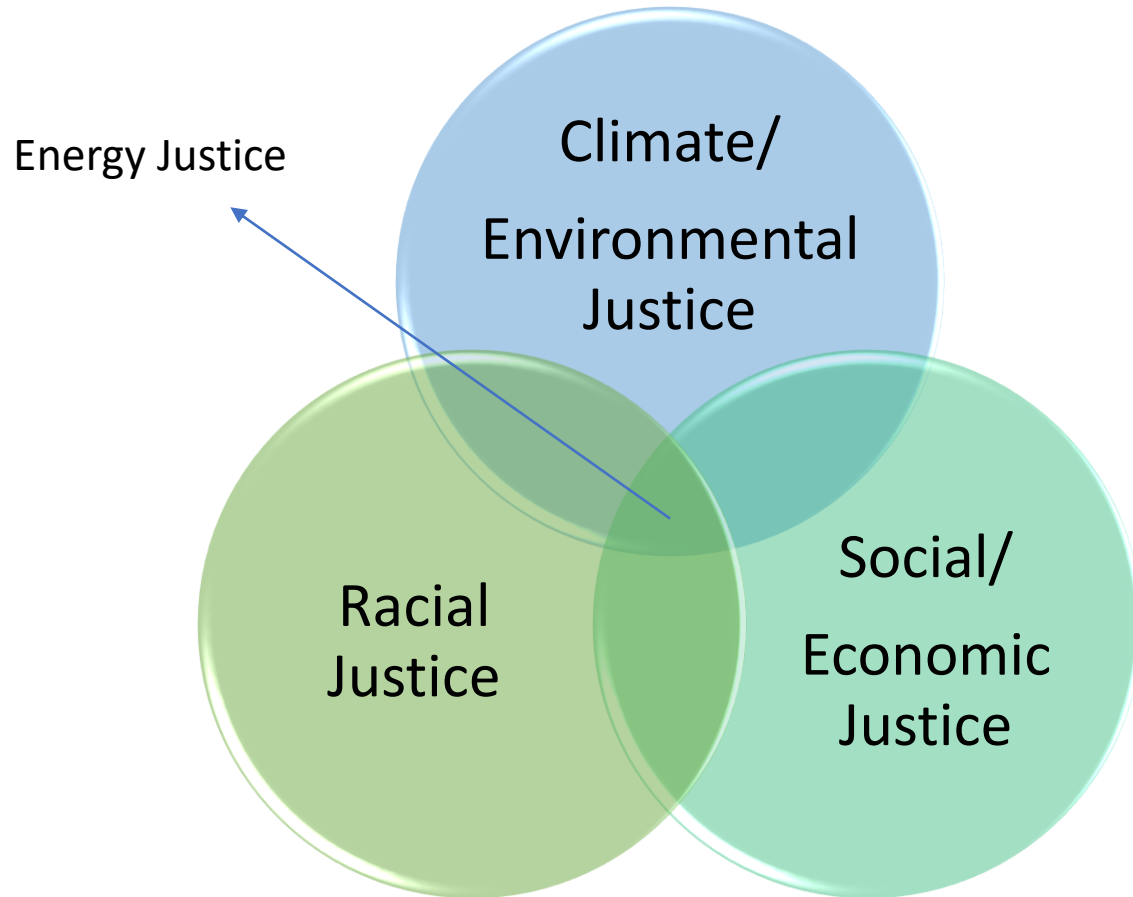
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Ideas to advance Energy Justice



- Streamline enrollment in energy assistance and shut-off protection programs
- Institute bill forgiveness, pre-paid meter* programs
- Apply a low-income rate based on ability to pay, not just fee elimination i.e. percent income payment (equal vs. equitable)
- Reduce/eliminate the practice of shut-offs and revisit reconnection policies and fees
- Make disconnection data publicly available
- Systematically collect data on customer income, race/ethnicity, medical conditions and household composition
- Partner with efficiency and clean energy providers to link LMI customers and subsidize transition
- Encourage use and knowledge of smart technologies for monitoring consumption and reducing costs



NOW IN EFFECT: Shut-off Season in Arizona!

ARIZONA

Date-based no

Temperature-based yes

Temperature 32° F and below

Seasonal Policy Temperature based

Other Utilities advised not to terminate residential service when the customer has an inability to pay and where weather will be especially dangerous to health (usually 32° F or below for winter and triple digits for summer) as determined by the Commission. There are also rules prohibiting disconnection of service for certain medical reasons. Several of Arizona's energy vendors enforce moratoriums with varying criteria.

PUC/PSC Consumer line: 602-542-4251 or 800-222-7000 (Phoenix area)

Contacts 520-628-6550 or 800-535-0148 (Tucson area)

Consumer www.azcc.gov/divisions/utilities/consumerservices.asp

**FAQ/Bill of
Rights**

Complaint form www.azcc.gov/Divisions/Utilities/forms/ComplaintForm2013.pdf